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United States dollar as an international currency

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Abstract

In this literature review I study the role of the United States dollar as an international currency by focusing on different aspects of this position. These aspects are the U.S. dollar as an official reserve currency, U.S. dollar hand-to-hand usage in foreign countries, U.S. dollar in international trade and U.S. dollar in international financial markets. We review these aspects by looking at their theory and position of U.S. dollar in each of these. We find that the United States dollar is still dominating currency internationally.

1. Introduction

The United States dollar is arguably the world's most important international currency today. Ever since the end of World War II it has played the dominant part in world trade and finance. Even after the downfall of the Bretton Woods system in 1971, the United States dollar remains as the central currency of choice for central banks and businesses alike around the globe. For that reason it is of great importance for business and policymakers alike to be aware of its position in the world and the development of its role in the world.

Historically world has had a few international currencies that have dominated the world of business, and as the times have changed, so has the currency of choice in international trade. Before the United States dollar the world's dominant currency in trade and finance was the British Pound (Krugman, 1980), but as the world's economic and power balance radically changed after the world wars the U.S. dollar came to dominate the British Pound as an international currency. As of today world is in the midst of a shift in economic power to East Asia, where the world's most populous country and second largest economy China continues to grow and exert its influence with the already developed economies of Japan and South Korea. Meanwhile the European common currency Euro has taken its place in international trading and business, but has not yet challenged the dominance of the United States dollar. It is of great interest whether the euro or the renminbi or their combined effect will challenge the role of U.S. dollar.

Because the United States dollar is such an important currency in the world today, its position as an international currency has been of great interest to many. The research has varied from general overviews to single areas of its usage in international setting. My purpose is to create a modern overview in which I review the different areas and their different theories and mechanisms of work to give the reader a comprehensive picture of the position of the U.S. dollar and try to see the big picture behind the position of U.S. dollar in using up to date literature and data. I also want to consider the combined effects of these different areas of interest in a way of their interaction with each other.

So what exactly is its position in the world today? In order for us to understand United States dollar's role in the world, we have to look at it objectively and deconstruct its role to manageable pieces from which we can gain a better understanding of it, the different markets that it functions in and its relation to other major currencies. In order to do so, I will loosely follow the approach similar to Blinder (1996), who used a working definition of central international currency as one that should have the four following characteristics:

1. It should constitute a preponderant share of the official reserves of central bank.
2. It should be used extensively as hand-to-hand currency in foreign countries.
3. It should be used to denominate a disproportionate share of international trade.
4. It should have a dominant role as the currency-of-choice in international financial markets.

These characteristics relate to the currency's role as a store of value, medium of exchange, and unit of account.

I will use these characteristics to separate the areas of interest into four distinct categories, in which I will review the current status of the United States dollar, compare it to other major currencies and look at relevant up-to-date research to help gain insight into these categories with established theories and mechanism of their workings. What I hope to achieve is a good overall review on the position of the United States dollar in the context of established theories and data that helps the reader to grasp the whole of the picture.

2. United States Dollar as an official reserve currency

Central banks are in charge of deciding the composition of their reserves and choices in reserve currencies. Usage of United States Dollar as a reserve currency by other central banks is the only area which is influenced by policy decisions (Blinder, 1996). Central banks always have policy objectives and they operate in the markets to achieve these objectives, so their operations are also influenced by markets. For example Federal Reserve System states their general functions are the following (https://www.federalreserve.gov/aboutthefed/files/pf_1.pdf):

- Conduct the nation's monetary policy to promote maximum employment, stable prices and moderate long-term interest rates.
- Promote the stability of the financial system and to minimize and contain systemic risks through active monitoring and engagement in the U.S and abroad.
- Promote the safety of individual financial institutions and monitor their impact on the financial system.

- Foster payment and settlement system safety and efficiency through services to the banking industry and the U.S. government that facilitate U.S. dollar transactions and payments.
- Promote consumer protection and community development

Other central banks also have generally similar objectives, such as price stability, economic growth, full employment and stability of the financial and payments system. Central banks are also always essential in the payments system of countries. Central banks use several ways through which they try to achieve their objectives. These are usually the management of the interest rates through lending, open market operations such as purchasing or selling equities, exchange rate interventions through buying or selling currencies and managing the minimal reserve requirements for banks.

IMF's Balance of Payments Manual (1993) defines central bank reserve assets; "foreign financial assets available to, and controlled by, the monetary authorities for financing or regulating payments imbalances or for other purposes. Reserve assets consist of monetary gold, SDRs, reserve position in the Fund, foreign exchange, and other claims. Changes in the holdings of reserves may reflect payments imbalances or responses to them, official exchange market intervention to influence the exchange rate, and/or other actions or influences."

IMF's Foreign Exchange Reserve Management guide (2013) offers a detailed list of the purposes of the foreign exchange reserves:

- "Support and maintain confidence in the policies for monetary and exchange rate management, including the capacity to intervene in support of the national or union currency;"
- "Limit external vulnerability by maintaining foreign currency liquidity to absorb shocks during times of crisis or when access to borrowing is curtailed, and, in doing so;"
- "Provide a level of confidence to markets that a country can meet its current and future external obligations;"
- "Demonstrate the backing of domestic currency by external assets; assist the government in meeting its foreign exchange needs and external debt obligations; and"
- "Maintain a reserve for national disasters or emergencies."

Similar reasons are also given by Benediktsson and Palsson from the Central Bank of Iceland (2005), according to them the reasons behind central banks holding foreign exchange reserves can be divided into two rough categories; the monetary policy and the financial stability reasons. In monetary policy of a country, foreign exchange reserves are needed especially in fixed exchange rate arrangements so that central banks can balance supply and demand of their currencies and alter the exchange rate of their currency. In the case of floating exchange rate central banks need to have

the possibility to intervene in the forex market, if for example it considers the exchange rate to be not in equilibrium or there is sudden volatility which threatens economic stability. The level of foreign exchange reserves also influences the credit rating of a country.

Financial stability is the other reason for holding foreign reserves (Benediktsson & Palsson, 2005), they are used in the case of shocks to the current account, so that the reserves can be used to balance currency flows in day to day and in unexpected circumstances. They are also used to guarantee the access to foreign markets and as preparation for possible natural disasters. Adequate foreign exchange reserves are needed to guarantee operational foreign exchange market and to ensure stability of financial system in shocks, if for example foreign credit markets dried up the central bank could use its foreign exchange reserves to cover the foreign interest payments and also lend foreign currency to domestic banks.

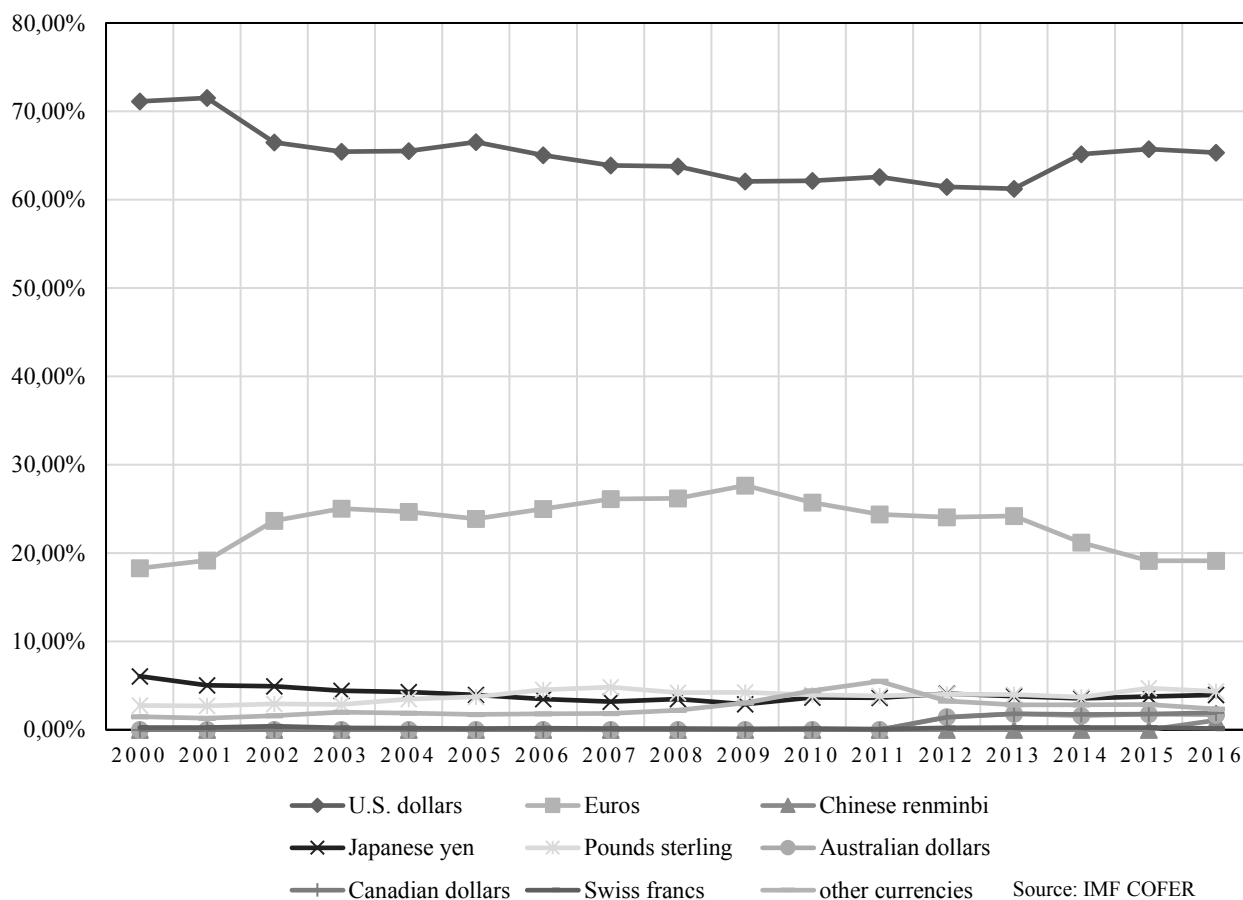
Central banks can use their foreign exchange reserves to intervene in the forex markets in order to achieve their policy objectives, which usually include aforementioned macroeconomic and other viewpoints. The main objectives for intervention are the following (Moreno, 2005):

- Influence the level of the exchange rate.
- Dampen exchange rate volatility.
- Supply liquidity to foreign exchange markets.
- Influence the amount of foreign reserves.

Now that we have established the basis of why the central banks need reserve currencies and what they use it for, let's look at the current situation.

WORLD CURRENCY COMPOSITION OF OFFICIAL FOREIGN EXCHANGE RESERVES

chart 1



As we can see, USD is clearly most preferred currency to any other for foreign exchange reserves, as of 2016 the percentage share is at 65,3 %. Compared to the second most used currency the euro with 19,1 % usage as of 2016. Third most used currency is the GBP with 4,3% share and fourth most used is the JPY with 4% share. Chinese RMB's share is 1,1%.

3. United States dollar as hand-to-hand currency in foreign countries

In this chapter we focus on usage of the United States dollar cash in foreign countries, thus approaching this subject similarly to Blinder (1996). However, we will expand the topic to also include not only U.S. dollars usage as a medium of exchange, but also as a store of value, since that is also major reason for the usage of U.S. dollars abroad (Feige, 2011).

Cash usage of U.S. dollar in foreign countries can be seen in two different ways as an official usage of U.S. dollar as a nation's official currency and legal tender and on the other hand as informal usage of the U.S dollar in the form of secondary currency use or currency substitution besides the national currency of a nation.

U.S. dollar is used in some countries as their official currency instead of national currency. The decision by policymakers to adopt foreign currency as their official currency is seen in similar way as if a country would favor to peg their national currency to foreign currency or form a currency board to foreign currency or to form a currency union with a foreign country (Alesina & Barro, 2001). According to Alesina and Barro (2001) the "countries that should be more likely to abandon their currencies are those that exhibit the following characteristics:"

- "History of high and variable inflation"
- "Large actual or potential volume of international trade, particularly with the anchor country"
- "Business cycles that covary substantially with a potential anchor"
- "Reasonably stable relative prices (gauged by real exchange rates) with respect to a potential anchor"

Few small countries outside of United States of America use the U.S. dollar as their official or legal currency. According to CIA (<https://www.cia.gov/library/publications/the-world-factbook/fields/2076.html>) the following countries or territories use the USD as their official currency:

- American Samoa (U.S territory)
- British Indian Ocean Territory (British overseas territory)
- British Virgin Islands (British overseas territory)
- Ecuador
- El Salvador
- Guam (U.S territory)
- Marshall Islands (Sovereign State with free association with U.S.A)
- Micronesia (Sovereign State with free association with U.S.A)
- Northern Mariana Islands (U.S insular area)
- Palau (Sovereign State with free association with U.S.A)
- Puerto Rico (U.S territory)
- Timor Leste

- Turks and Caicos Islands (British overseas territory)
- Virgin Islands (U.S insular area)
- Zimbabwe

Some countries also have chosen the euro as their official currency. According to CIA (<https://www.cia.gov/library/publications/the-world-factbook/fields/2076.html>) the following countries or territories outside of eurozone use the euro:

- Andorra
- Akrotiri and Dhekelia (British overseas territory)
- Kosovo
- Monaco
- Montenegro
- Vatican
- Saint Barthelemy (France overseas collectivity)
- Saint Martin (France overseas collectivity and Dutch constituent country)
- Saint Pierre and Miquelon (France overseas collectivity)
- San Marino

Most of the countries that use foreign currency as legal or official currency are territories or other small countries, but also some bigger countries use either the dollar or the euro.

The other and more difficult to analyze demand source for cash U.S dollars are the phenomena of secondary currency usage and currency substitution. The secondary currency usage refers to the phenomena wherein a foreign currency circulates in a country with the national currency.

According to Colacelli and Blackburn (2009) the reasons for secondary currencies can be separated into two categories. The first is the currency substitution due to hyperinflation or instability of national currency and the foreign currency is used as a medium of exchange and store of value. This phenomena is more common in developing or transitional economies. The other reason for secondary currency arises because of the scarcity of the national currency and the foreign currency is used only as a medium of exchange.

Banegas et al. (2015) found that U.S. dollar shipments to foreign countries are strongly correlated to the financial and economic uncertainty from 2008 onwards and to lesser amount earlier. They argue that U.S. dollars function mainly as a safe asset. Hellerstein and Ryan (2009) also found out in their research that history of high inflation leads a country to adopting a secondary currency.

Botta (2003) argues that there are five basic reasons for holding and using cash dollars:

- “In times and places where the political or economic situation is uncertain, dollars are held for security against inflation and general calamity.”
- “Expatriate workers throughout the world often carry their earnings to their home countries in dollars and, between visits home, some of these workers hold dollars in cash rather than in a bank.”
- “Travellers to other parts of the world carry dollars because they are easier to exchange than local currencies.”
- “Cross-border trade in many areas is conducted largely in dollars.”
- “The informal or “off the books” sectors in many economies are highly dollarised.”

The United States dollar’s role as a hand-to-hand currency in foreign countries is difficult to quantify because of the nature of the phenomena, especially considering it’s widespread usage in informal sector of the economy around the world according to United States Treasury Department (“The Use and Counterfeiting of United States Currency Abroad, Part 3”, 2006). The amount of physical currency in foreign countries is therefore unobservable and generally must be only estimated (Hellerstein & Ryan, 2009).

Then turning to the amount of U.S dollars abroad we also find different results on the estimates. According to Federal Reserve (https://www.federalreserve.gov/paymentsystems/coin_about.htm) “more than 99% of all U.S currency in circulation is in the form of Federal Reserve notes”. So most estimates concern themselves mainly with the amount of notes abroad. Botta (2003) estimates that at the end of May 2002 50-70% of all USD notes were held abroad, this amounts to 310-435 billion USD. According to Goldberg (2010) “about 65 percent of all U.S. banknotes are in circulation outside the country”. She also estimates the total amount to be 580 billion USD in physical currency at the end of March 2009. Feige (2011) estimates that the share of USD abroad is 30-37% based on the Federal Reserve data. At the end of 2010 he estimates 30.7% of currency held abroad is totaling to 282.2 billion USD. Judson (2017) used different methods to estimate that “half or a bit more than half of U.S currency circulates abroad”, and for specific estimate from a simple method she got 900 billion USD abroad at the end of 2016 in total value.

The wide range of the estimates themselves and the time difference creates difficulty for us to see whether the use of U.S dollars are used extensively outside United States of America, but we can gain insight into it by comparing it to the second most prominent currency, the euro. The European Central Bank External Statistics Division (2017) estimates that “at the end of 2016 residents outside

the euro area held approximately €341 billion in euro banknotes”. At the last day of 2016 the exchange rate was quite close to a parity (EUR=USD 1.0541). We can thus estimate that although the estimates are wide and difficult to quantify, based on the 2017 estimates by Judson and the ECB External statistics Division it is reasonable to say that same or more of U.S. currency in value is circulating outside its borders than Euros.

4. United States dollar in international trade

In this chapter we are going to focus on the usage of United States dollar in international trade. Following Blinder’s approach in which international trade represents the usage of currency as a medium of exchange by companies who do trade in cross border and international markets. Usage of currency in international trade is one of the most essential functions of such currency, because international trade has been historically a defining trait for international currencies. Before reserve currencies existed and before international financial markets were functional the international currency was the currency mainly used in international trade (Auboin, 2012). We will look at different categories of international trade from which we can gain insight into the dominant currencies and also look at who decides which currencies they should use in invoicing and international trade. Categories we will be looking at are the use of currency denominations in international invoices and settlements.

Exporting companies are the decision makers of choosing which currency should they select for invoicing their trade with foreign countries. They have three generalized options to choose which currency to use in invoicing the transaction (Goldberg & Tille, 2005):

- Own currency, producer’s currency pricing (PCP)
- Destination country’s currency, local currency pricing (LCP)
- Third currency, vehicle currency pricing (VCP)

These three possibilities can also be seen as two separate choices between the choice of vehicle currency or a nonvehicle currency. Nonvehicle currency means a currency which either the importer or the exporter uses in domestic market. Vehicle currency is a currency of a third country which is not part of the exchange. Most international trade is priced in nonvehicle currencies instead of

vehicle currencies. Nonvehicle currencies can be separated into three kinds of currencies (Magee & Rao, 1980):

- Major currencies are used dominantly of the two currencies in bilateral trade to both directions.
- Minor currencies are opposite of major ones, they are not used as much as the major currency in trade to both directions.
- Symmetric currencies are currencies in which other currency dominates trade to other direction, and other currency to the other direction.

According to Rey (2001), the vehicle currencies are used instead of the national currencies of either the importer or the exporter in cases where the real exchange through using a vehicle currency can be achieved at a lower total cost than the national currencies. Internationally the most important aspect for a currency to function as a vehicle currency in grand scale is the amount of trade in international markets done in the currency rather than the size of the currency's home region or country.

From the generalized possibilities of vehicle or nonvehicle currency, and the currency of the importer or the exporter companies decide which currency to use. The invoicing currency selection is driven by several motives by the producers. These motives are according to Goldberg (2008):

- Size of the currency's home country.
- Exchange rate regime of the currency.
- Transaction costs.
- Currency selection of other producers for international trade.
- Industry composition of exports or imports.
- Macroeconomic volatility.

Home country size captures the dimension of the scale of the issuing country. Exchange rate regime captures the dimension of role the currency might play in international currency systems, like if it is anchored to by other currencies. Transaction costs capture the cost of using the currency for transactions such as in ask-bid spreads (Goldberg, 2008). Currency selection of other producers for international trade and industry composition of exports or imports reflect the competition aspect of companies and the type of goods the exporters produce and sell to international markets. Especially

important is how much of homogenous goods or close substitutes they produce. Macroeconomic volatility also affect the choice of currency or vehicle currency of producers, because exporters prefer low volatility currencies (Goldberg & Tille, 2005).

These motives lead to two types of forces which are the dominant forces for exporters in determining their invoicing currency. They are “herding” and “hedging” forces. The “herding” force is caused by competition of the exporters in such a way, that it is most rational for exporters to use same invoicing currencies as their competitors. This is because if exporters choose different invoicing currencies and exchange rates fluctuate it leads to big price differences in their markets compared to their competitors. However if they use the same invoicing currency the exchange rate affects both companies similarly. This phenomena is most dominant in commodities and other close substitutes markets (Goldberg, 2008).

Golberg (2008) also continues that the “hedging” force is caused by the fluctuation of exchange rates, and exporters prefer currencies with stability and they hedge against states of the world by using currency in which their marginal costs move together with their marginal revenues.

Another force that also plays a role in the selection of currency for invoicing is inertia. Widely used currency has economies of scale because of lower transaction costs and more liquidity than not so commonly used currencies. Exporters prefer the currency with lowest transaction costs to maintain their competitiveness in international markets, thus leading them to use the widely used currencies which provide high liquidity and low transaction costs (Auboin, 2012).

Now that we have looked at the forces and motives that guide the exporters and importers in the international trade markets, and also the their options in making the decisions about which currency to choose for invoicing and trading, let look at the current situation in the usage of different currencies in international payments.

In an information paper by SWIFT (Society for Worldwide Interbank Financial Telecommunication), City of London, Paris EUROPLACE, Commerzbank, BNY Mellon and Bank of America Merrill Lynch published in 2015 the writers from those institutions analyzed the unique data that the system of financial communication provides about the worldwide payments and monetary financial flows. In that they provided the following shares for the selected main currencies used in all international cross-border trade that uses the SWIFT system.

INTERNATIONAL SWIFT CROSS-BORDER TRANSACTIONS					
Value	USD	EUR	GBP	JPY	RMB
2012	47,6 %	33,0 %	5,9 %	-	-
2013	51,3 %	31,0 %	5,4 %	-	-
2014	51,9 %	30,5 %	5,4 %	1,8 %	0,5 %
Source: Worldwide Currency Usage and Trends, SWIFT					

The ranking of these selected currencies in size in 2014 is the following: 1. USD, 2.EUR, 3.GBP, 5. JPY and 11. RMB.

As we can see from the data, USD is the leading currency with 51.9% share of cross-border trade as of 2014. Euro is following close with 30,5% share. Third is the GBP with 5,4% of usage.

SWIFT also provided list of currencies used in inter-regional transactions between Americas, Europe and Asia-Pasific areas.

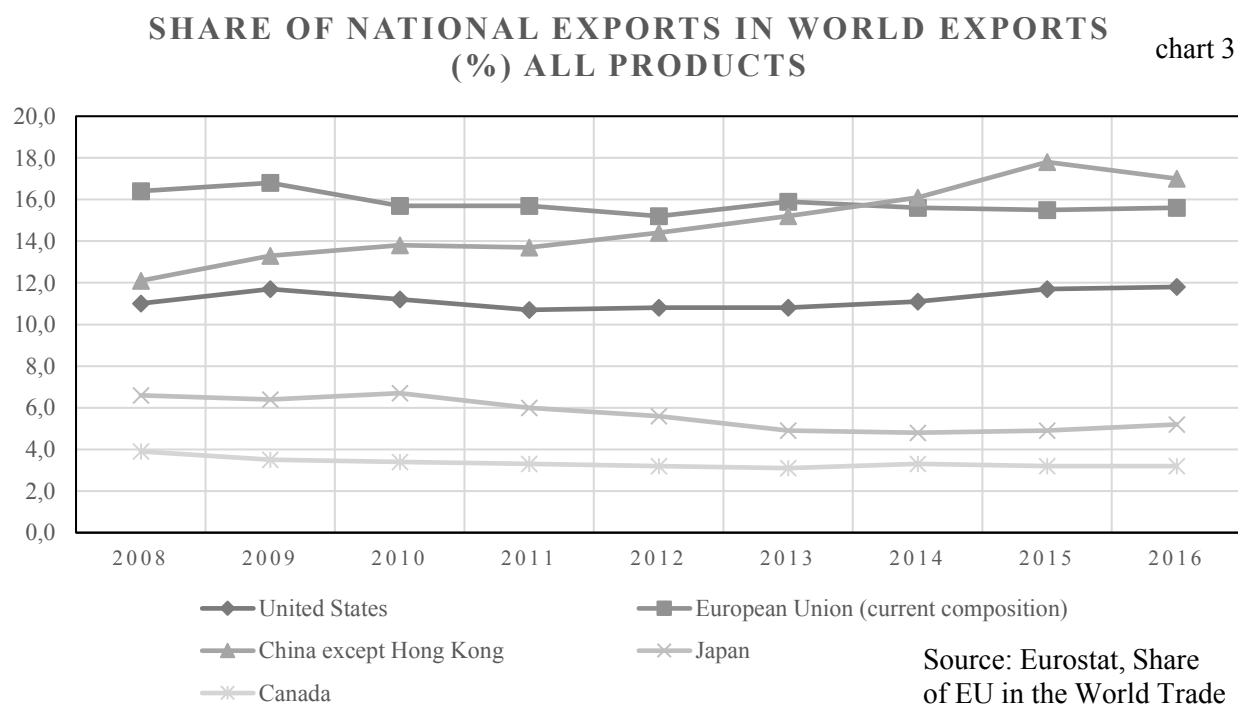
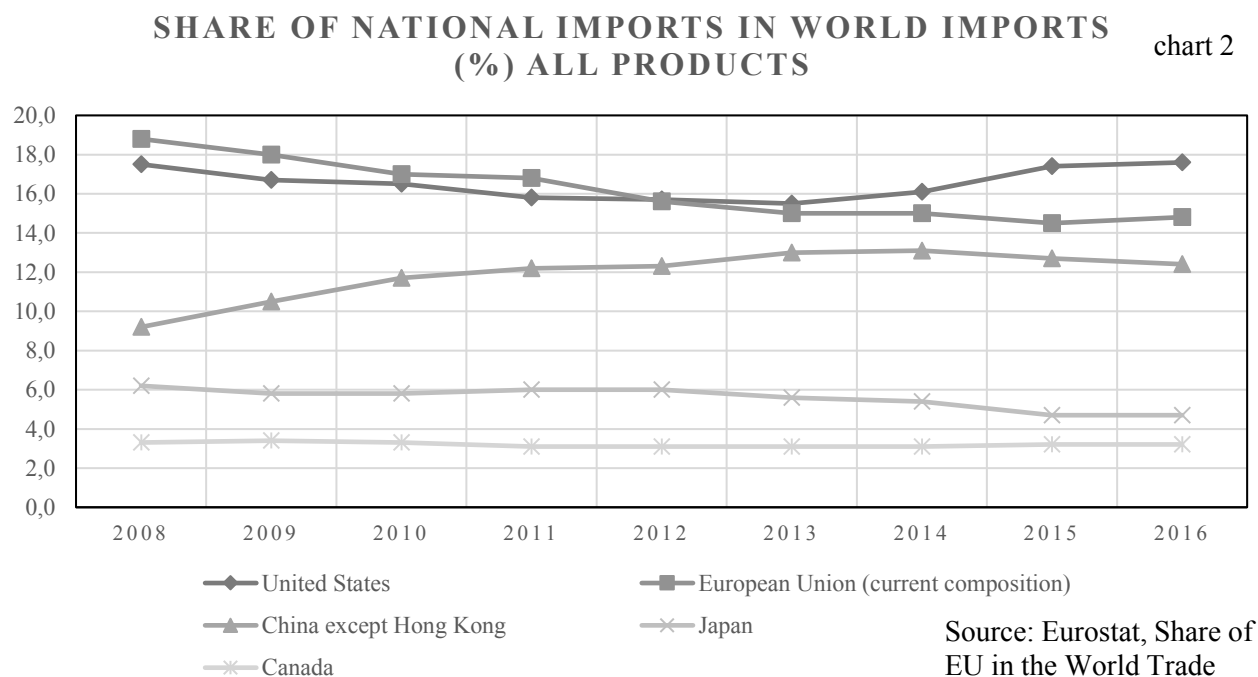
INTER-REGIONAL TRANSACTIONS (excl. domestic and intra-regional transactions)						
	USD	EUR	JPY	GBP	CAD	Others
2012 Q4	80,3 %	5,9 %	2,9 %	2,4 %	2,7 %	5,8 %
2014 Q4	79,5 %	5,9 %	3,3 %	3,2 %	2,3 %	5,8 %
Source: Worldwide Currency Usage and Trends, SWIFT						

Ranking of the usage of these selected major currencies is the following: 1.USD, 2. EUR, 3.JPY, 4.GBP.

In inter-regional trade the USD is also most used currency with 79,5% share, followed in second by the euro with 5,9%, but in inter-regional trade the difference is tremendous compared to cross-border trade. The cross-border transactions data suffers from the Single Euro Payments Area (SEPA) system which distorts the data. Third is the JPY with 3,3% share followed by the GBP with 3,2% share.

As we see from the data from SWIFT system, the USD dominates both ways to look at the international trade payments. Some of the dominance of the USD and GBP is explained by SWIFT to be because of the influence of United Kingdom's and Unites States' banks in global payment systems and trade flows. In order to see if this dominance of USD is relational to the international trade of the Unites States and other countries in general let's look at the trade statistics from these selected countries or currency areas. Eurostat (http://ec.europa.eu/eurostat/en/web/products-datasets/-/EXT_LT_INTROLE) published statistics in its review of the EU:s position in global

international trade about the share of different countries and EU:s share in total world product imports and exports. In the following charts I have plotted from the data the biggest countries and areas and some other central countries.



As we can see from the charts, United States is the biggest importing country with 17,6% share of all world product imports, and third biggest exporter with 11,8% share as of 2016. The European Union is second in both imports and exports with 14,8% share of world product imports and 15,6% share of total product exports. China is the biggest exporter with 17% share of world product exports and third biggest importer with 12,4% share.

So how do the shares of world trade relate to the usage of these major currencies in international trade? We can see that for the USD its usage of 51,9% (cross-border transactions) and 79,5% (inter-regional transactions) is much higher than its share of 16,1% world imports or 11,1% share of world exports as of 2014. For the EUR its usage of 30,5% (cross-border transactions) and 5,9% (inter-regional transactions) is little more than its 15,0% share of total world product imports or 15,6% share of world export as of 2014. However the interpretation depends on whether we see the inter-regional transactions or the cross-border transactions as more important for the matter. China's RMB usage of 0,5% in cross-border transactions is miniscule compared to its share in world product imports of 13,1% or in the 15,2% share of world product exports as of 2014.

As we can see the United States dollar dominates the international trade in both absolute terms and in relation to the native size of the United States' international trade, thus we can say that USD is used to denominate a disproportionate share of the world international trade. The EUR is relatively little used in inter-regional trade compared to its size in world trading, but in cross-border transactions it is close to the USD. China's RMB is used very little compared to its size in world trade.

5. United States dollar in international financial markets

In this chapter we are going to delve into the role of the U.S. dollar in the international financial markets. We have already researched the U.S. dollar's role in the international trade, which concerns itself in trade in real goods and their movement and payment. However we have some overlap with these categories, especially considering the vehicle currency choice and inertia that also function in the international trade considering invoicing. In this chapter we are going to focus on financial markets and what the U.S. dollar's role and the current position is in these markets. Blinder (1996) argues that in the modern world the financial usage is more important to trade considerations in seeing the role of international currency. Let's begin our research in the international bond markets.

In his research, Areskoug (1980) argues that other things being equal, investors and issuers prefer bonds denominated in their own home currencies because they do not have exchange rate risk, and so they doesn't need to demand any premium for it. Also he argues that bond issuers will try to have their bonds denominated in the currencies which offer the best minimum combination of expected domestic currency debt-service and exchange risks. Both the issuers and the investors thus generally avoid the exchange risk whether the case is for appreciation or depreciation of currency. In results he concludes that "exchange rate stability, along with general acceptability in domestic or international payments, is an important currency attribute in long-term international capital markets".

Siegfried et al. (2007) found in their research that the choice for companies whether to issue bond in foreign or domestic currency is determined by their attempt to hedge foreign exposure. Companies also consider their investor base and large companies prefer to diversify it by issuing in foreign currency. For large companies their fund raising might also run into problems due to small local markets, which favors the issuance in foreign currency. The choice of the foreign currency also involves the same consideration of hedging the foreign exposure.

Habib and Joy (2008) also offer results favoring the interest rate differential approach to the drivers of motive for issuing foreign currency denominated bonds. According to them "issuers of foreign-currency-denominated bonds are sensitive to international differences in nominal interest rates and choose their currency of issuance at least partly in response to these differences". They also say that issuers favor issuing bond denominated in currency associated with relatively low interest rate.

McCauley et al. (2015) did a comprehensive and modern research on global dollar credit. They researched both the bond market but also the dollar credit to non-US borrowers. In their work they give several reasons for foreign currency bank credit taking. Their research also studied the bond markets and dollar denominated bonds. Firstly they found out that "offshore dollar credit grows faster where local interest rates are higher than dollar yields" and that "the wider the gap between local 10-year yields and those on US treasury bonds, the faster the next quarter growth in outstanding US dollar bonds issued by non-US resident borrowers". According to them the "dollar credit has grown fastest outside the US where it has been relatively cheap". Second reason they give is that before the financial crisis banks could funnel dollar credit to foreign countries due to low volatility and easy wholesale financing. Third they say that after the financial crisis many companies and governments have issued U.S. dollar bonds because of the attractiveness it offers to the investors due to higher return on them than low return US Treasury bonds. One of the interesting findings was that investors and depositors outside the US provide the most of the dollar

credit to non-US borrowers, because non-US banks have large amount of dollar deposits and they can swap other currencies to dollars. They also calculated the amount of dollar, euro and yen credit to non-financial foreign borrowers for the respective countries or areas in mid-2014:

- Dollar denominated credit to non-financial borrowers outside United States was \$8 trillion.
- Euro denominated credit to non-financial borrowers outside Eurozone \$2.5 trillion.
- Yen denominated credit to non-financial borrowers outside Japan \$0.6 trillion.

European Central Bank (International Role of the Euro, 2017) also estimates the different shares for currencies in the international foreign currency-denominated debt markets in fourth quarter of 2016:

- USD 63% share
- EUR 22% share
- JPY 2.6% share
- Other 12.3% share

Now we turn to the role of the U.S. dollar in the international foreign currency exchange markets. Krugman (1980) in his research explains the importance of the usage of a vehicle currency which is used to trade other currencies due to the transaction cost advantage of high volume. He argues that currency that is important in the payments system of the world can serve this function. He also adds that when a currency has achieved this kind of role it will be self-reinforcing and requires shift in economic balance or shocks to the system to change. But even if the country becomes not so dominant the role of its currency can persist.

McCauley and Scatigna (2011) argue that for some currencies the dominating force is their usage in underlying trade and for others it is the financial transactions. They say that a rise of income per capita of a country leads to higher level of currency trading and the trading of currency starts to deviate from the international trade level of a country. They also found out that high- and low-yielding currencies have more turn out due to their usage in carry trades.

In a BIS survey (Triennial Central Bank Survey 2016), the researchers argue that the US dollar is the world's dominant vehicle currency, in April 2016 being on one side of 88% of all trades. In 2016 the top currencies and their shares in OTC (Over The Counter) foreign exchange turnover

were the following (the sum of the percentage shares is 200% because currencies are traded in pairs):

1. USD 87.6% share
2. EUR 31.4% share
3. JPY 21.6% share
4. GBP 12.8% share
5. AUD 6.9% share

As we can see the U.S. dollar clearly dominates the other currencies also in this category.

6. Conclusions

We have now reviewed all the categories that Blinder (1996) gave to constitute an international currency. We have reviewed the U.S. dollar's position in these and also reviewed the position of the other main currencies. We have also reviewed some basic mechanics and theory that surrounds these different areas of interest. It seems to be that the U.S. dollar is still dominating other currencies as an international currency in all of these categories, in some quite heavily and in other more lightly.

The implications of this special position of the U.S. dollar for the United States of America is not simple of course. On the other hand Federal Reserve has earned windfall earnings of \$287 billion in seignorage income in the years 1964-2010 due to foreign holdings of U.S. dollars (Feige, 2011). But on the other hand such a wide share of U.S. dollars circulating offshore probably creates new challenges for planning and doing monetary policy of a nation. United States of America should also be aware of this position of their currency and the great importance it plays in the world.

These different categories also seem not be completely separate of one another. As written before in the chapters the central banks need reserve currency that they can use to operate in the foreign exchange markets, and in the foreign exchange market the U.S. dollar is most favored one. So instead of seeing these categories as separate they could be seen as linked by market forces. Also the international trade and the financial markets could be seen as closely linked, other just considers itself more with the trade of the real good and the other with payments and capital.

The status of U.S. dollar does not seem to have declined remarkably since the creation of euro, but the euro has become the second most dominant currency in almost all of the categories also. Other

currencies status is marginal compared to these two main currencies. As Krugman (1980) stated the international currency can stay dominant for a long time even after the economic power of the country has declined. However this is of course not the case with United States of America today, as it remains a strong economy. The effect of the rise of China and India as large trading nations probably will affect the position of U.S. dollar, but it remains to be seen by how much. For now U.S. dollar remains as the most prominent international currency in all of the categories we reviewed and also in the world.

Appendix

World Currency Composition of Official Foreign Exchange Reserves (Source: IMF COFER)										
	USD	EUR	RMB	JPY	GBP	AUD	CAD	CHF	others	Total
2000	71,1 %	18,3 %	0,0 %	6,1 %	2,8 %	0,0 %	0,0 %	0,3 %	1,5 %	100,0 %
2001	71,5 %	19,2 %	0,0 %	5,0 %	2,7 %	0,0 %	0,0 %	0,2 %	1,3 %	100,0 %
2002	66,5 %	23,7 %	0,0 %	4,9 %	2,9 %	0,0 %	0,0 %	0,4 %	1,6 %	100,0 %
2003	65,4 %	25,0 %	0,0 %	4,4 %	2,9 %	0,0 %	0,0 %	0,2 %	2,0 %	100,0 %
2004	65,5 %	24,7 %	0,0 %	4,3 %	3,5 %	0,0 %	0,0 %	0,2 %	1,9 %	100,0 %
2005	66,5 %	23,9 %	0,0 %	4,0 %	3,7 %	0,0 %	0,0 %	0,1 %	1,7 %	100,0 %
2006	65,0 %	25,0 %	0,0 %	3,5 %	4,5 %	0,0 %	0,0 %	0,2 %	1,8 %	100,0 %
2007	63,9 %	26,1 %	0,0 %	3,2 %	4,8 %	0,0 %	0,0 %	0,2 %	1,8 %	100,0 %
2008	63,8 %	26,2 %	0,0 %	3,5 %	4,2 %	0,0 %	0,0 %	0,1 %	2,2 %	100,0 %
2009	62,1 %	27,7 %	0,0 %	2,9 %	4,2 %	0,0 %	0,0 %	0,1 %	3,0 %	100,0 %
2010	62,1 %	25,7 %	0,0 %	3,7 %	3,9 %	0,0 %	0,0 %	0,1 %	4,4 %	100,0 %
2011	62,6 %	24,4 %	0,0 %	3,6 %	3,8 %	0,0 %	0,0 %	0,1 %	5,5 %	100,0 %
2012	61,5 %	24,1 %	0,0 %	4,1 %	4,0 %	1,5 %	1,4 %	0,2 %	3,3 %	100,0 %
2013	61,2 %	24,2 %	0,0 %	3,8 %	4,0 %	1,8 %	1,8 %	0,3 %	2,8 %	100,0 %
2014	65,1 %	21,2 %	0,0 %	3,5 %	3,7 %	1,6 %	1,7 %	0,2 %	2,8 %	100,0 %
2015	65,7 %	19,1 %	0,0 %	3,8 %	4,7 %	1,8 %	1,8 %	0,3 %	2,9 %	100,0 %
2016	65,3 %	19,1 %	1,1 %	4,0 %	4,3 %	1,7 %	1,9 %	0,2 %	2,4 %	100,0 %

Share of national imports in world imports (%) all products
(Source: Eurostat, Share of EU in the World Trade)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
United States	17,5	16,7	16,5	15,8	15,7	15,5	16,1	17,4	17,6
European Union (current composition)	18,8	18,0	17,0	16,8	15,6	15,0	15,0	14,5	14,8
China except Hong Kong	9,2	10,5	11,7	12,2	12,3	13,0	13,1	12,7	12,4
Japan	6,2	5,8	5,8	6,0	6,0	5,6	5,4	4,7	4,7
Canada	3,3	3,4	3,3	3,1	3,1	3,1	3,1	3,2	3,2

Share of national exports in world exports (%) all products
(Source: Eurostat, Share of EU in the World Trade)

	2008	2009	2010	2011	2012	2013	2014	2015	2016
United States	11,0	11,7	11,2	10,7	10,8	10,8	11,1	11,7	11,8
European Union (current composition)	16,4	16,8	15,7	15,7	15,2	15,9	15,6	15,5	15,6
China except Hong Kong	12,1	13,3	13,8	13,7	14,4	15,2	16,1	17,8	17,0
Japan	6,6	6,4	6,7	6,0	5,6	4,9	4,8	4,9	5,2
Canada	3,9	3,5	3,4	3,3	3,2	3,1	3,3	3,2	3,2

References

- Alesina, Alberto and Barro, Robert J. 2001. "Dollarization". American Economic Review, Papers and Proceedings 91, 381-85.
- Areskoug, Kaj. 1980. "Exchange Rates and the Currency Denominations of International Bonds". Economica, New Series, Vol. 47, No 186, 159-163.
- Auboin, Marc. 2012. "Use of Currencies in International Trade: Any Changes in the Picture?". Staff Working Paper WTO.
- Balance of Payments Manual, Fifth edition. 1993. International Monetary Fund.
- Banegas, Ayelen. Judson, Ruth. Sims, Charles and Stebunovs Viktors. 2015. "International Dollar Flows". International Finance Discussion Papers Number 1144.
- Benediktsson, Haukur C. and Pálsson, Sturla. 2005. "Central bank foreign reserves". Central Bank of Iceland Monetary Bulletin, Vol. 7 No. 3.
- Blinder, Alan S. 1996. "The Role of the Dollar as an International Currency". Eastern Economic Journal 22.2, 127–136.
- Botta, Joseph. 2003. "The Federal Reserve Bank of New York's experience of managing cross-border migration of US dollar banknotes". BIS Papers No 15.
- Colacelli, Mariana and Blackburn, David J.H. 2009. "Secondary currency: An empirical analysis". Journal of Monetary Economics 56, 295-308.
- Eurostat, Share of EU in the World Trade ([http://ec.europa.eu/eurostat/en/web/products-datasets/-/EXT LT INTROLE](http://ec.europa.eu/eurostat/en/web/products-datasets/-/EXT_LT_INTROLE)) retrieved 1.5.2018
- "Estimation of euro currency in circulation outside the euro area". 2017. European Central Bank External Statistics Division. (https://www.ecb.europa.eu/pub/pdf/other/estimating_eur_in_circulation_outside_the_euro_area-201704.en.pdf) retrieved 27.4.2018
- Feige, Edgar L. 2011. "New estimates of U.S. currency abroad, the domestic money supply and the unreported Economy". Crime, Law and Social Change, Vol.57, No. 3
- Golberg, Linda S. and Tille, Cedric. 2005. "Vehicle Currency Use in International Trade". Staff Report no. 200, Federal Reserve Bank of New York.
- Goldberg, Linda S. 2010. "Is the International Role of the Dollar Changing?". Current issues in economics and finance Vol 16 Number 1. Federal Reserve Bank of New York.
- Goldberg, Linda. 2008. "Observations on Currency Invoicing of International Trade". (<https://www.newyorkfed.org/medialibrary/media/research/economists/goldberg/PetersonIIEdollaraNdtradeGoldberg.pdf>)

Habib, Maurizio Michael and Joy, Mark. 2008. "Foreign-Currency Bonds: Currency Choice and the Role of Uncovered and Covered Interest Parity". European Central Bank Working Papers Series No 947.

Hellerstein, Rebecca and Ryan, William. 2009. "Cash Dollars Abroad". Federal Reserve Bank of New York Staff Report no. 400.

International Role of the Euro. 2017. European Central Bank.
(<https://www.ecb.europa.eu/pub/pdf/other/ecb.euro-international-role-201707.pdf>) Retrieved 1.5.2018

Judson, Ruth. 2017. "The Death of Cash? Not So Fast: Demand for U.S. Currency at Home and Abroad, 1990-2016". Board of Governors of Federal Reserve System Division of International Finance.
(https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_judson.pdf?__blob=publicationFile) retrieved 25.4.2018

Krugman, Paul. 1980. "Vehicle Currencies and the Structure of International Exchange". Journal of Money, Credit and Banking, Vol. 12, No. 3.

Magee, Stephen P. and Rao, Ramesh K. S.. 1980. "Vehicle and Nonvehicle Currencies in International Trade". The American Economic Review Vol. 70, No. 2, 368-373.

McCauley, Robert and Scatigna, Michela. 2011. "Foreign exchange trading in emerging currencies: more financial, more offshore". BIS Quarterly Review March 2011.

McCauley, Robert N., McGuire, Patrick and Sushko, Vladyslav. 2015. "Global dollar credit: links to US monetary policy and leverage". BIS Working Papers No 483.

Moreno, Ramon. 2005. "Motives for intervention". BIS papers, No 24

Overview of the Federal Reserve System.
(https://www.federalreserve.gov/aboutthefed/files/pf_1.pdf) retrieved 17.4.2018

Revised Guidelines for Foreign Exchange Reserve Management. 2013. International Monetary Fund

Rey, Hélène. 2001. "International Trade and Currency Exchange". The Review of Economic Studies, Vol. 68, No. 2, 443-464

Siegfried, Nikolaus. Simeonova, Emilia and Vespro Cristina. 2007. "Choice of Currency in Bond Issuance and the International Role of Currencies". European Central Bank Working Paper Series No 814.

Triennial Central Bank Survey: Foreign exchange turnover in April 2016. 2016. BIS Triennial Central Bank Survey 2016. (<https://www.bis.org/publ/rpfx16fx.pdf>) retrieved 1.5.2018

"The Use and Counterfeiting of United States Currency Abroad, Part 3". 2006. United States Treasury Department.

Worldwide Currency Usage and Trends. 2015. SWIFT.

(https://www.cityoflondon.gov.uk/business/economic-research-and-information/research-publications/Documents/research-2015/SWIFT_Currency_Evolution.pdf) retrieved 1.5.2018

<https://www.cia.gov/library/publications/the-world-factbook/fields/2076.html> retrieved 25.4.2018

https://www.federalreserve.gov/paymentsystems/coin_about.htm retrieved 27.4.2018.